From: Jim Quiter <jim.quiter@arup.com>
To: wtc@nist.gov
Cc: dlowe@nist.gov
Subject: WTC Draft Final Report Comment Form for Report: NCSTAR 1

Information Submitted on: 8/1/2005.

Name : Jim Quiter
Affiliation : Arup ATG
Email Address : jim.quiter@arup.com
Phone : 415 957 9445
Report Number : NCSTAR 1
Page Number : 224
Paragraph : Table 9b
Comment : IBC, IEBC, IFC and NFPA 5000 are affected by more than Group 2 and 7 comments
Comment Reason : to clarify roles for moving forward

Revision Suggestion : Include the following groups for IBC, IEBC, IFC and NFPA 5000:
2. Enhanced Fire Resistance of Structures
3. New Methods for Fire Resistance Design of Structures
4. Enhanced Active Fire Protection
5. Improved Building Evacuation
7. Improved Procedures and Practices

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Name : Jim Quiter
Affiliation : Arup ATG
Email Address : jim.quiter@arup.com
Phone : 415 957 9445
Report Number : NCSTAR 1
Page Number : 210
Paragraph : 9.2.5 / Recommendation 16
Comment : (1) It is suggested that roles be better defined, or recommendations for a national steering committee be provided to develop better define roles should be provided for developing emergency planning, evacuation plans, and occupant emergency / evacuation training, as well as the overall national public information campaign. A joint NFPA / ICC national standard, with representation from AIA, ASME, ASCE, BOMA, CTBUH, IAFC, NCSBCS, NIBS, NASFM and SFPE would be a first pass at include many of the important parties.
(2) Additionally, specific funding mechanisms should be suggested.
(3) NFPA and ICC should be included within the effected organizations.

Comment Reason : (1) It is unclear which public agencies and non-profit organizations should be involved and what form should the public information campaigns take (i.e. television, radio, or other media). While a comprehensive national standard for building emergency planning, and evacuation training and plans would be a marked improvement over the current fragmented bits of information, specific information should be provided so that this recommendation can be moved forward.
(2) It is also unclear what funding mechanisms could support a consistent comprehensive nationwide educational campaign.
(3) NFPA and ICC are affected by this comment

Revision Suggestion : (1) Define roles or recommend steering committee to define roles □ a joint NFPA / ICC national standard, with representation from AIA, ASHRAE, SFPE, NIBS, NCSBCS, BOMA, CTBUH and other industry representatives could form an initial steering committee
(2) Specific funding mechanisms should be provided
(3) Include NFPA and ICC within the effected organizations

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In

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Email Address : jim.quiter@arup.com
Phone : 415 957 9445
Report Number : NCSTAR 1
Page Number : 211
Paragraph : 9.2.5 / Recommendation 17
Comment : (1) The following egress simulation issues should reviewed: better simulation of merging flows, better characterizing pre-decisional times, better understanding the range of occupant mobility, better understanding of visibility and egress through smoke and other adverse conditions be should given priority, and better understanding of how fatigue affects mobility, as well as fire fighter effectiveness, affect ascend/descending a large number of flights. Further, It is recommended that stairs be designed to resist becoming affected by smoke and other contaminants, rather than investigating evacuation through smoke filled stairs.

(2) Clarify counter flow suggestion.

(3) It is recommended that the suggestion for a dedicated stair for fire fighter access be removed.

(4) Occupant fatigue may have contributed to reported occupant movement speeds being less than that in the literature.

Comment Reason : (1) Better simulation of merging flows, better characterizing pre-decisional times, better understanding the range of occupant mobility, better understanding of visibility and egress through smoke and other adverse conditions be should given priority, and better understanding of how fatigue affects mobility, as well as fire fighter effectiveness, affect ascend/descending a large number of flights would likely have a greater effect upon egress simulation times than those stated.

(2) The report indicates that counterflow by emergency personnel did not significantly affect occupant flow (NISTNCSTAR1-7 Report Section 11.3 item 3); however Section 10.3.8 suggests that counterflow can pose a significant issue. This is conflicting.

(3) Recommendation 17 suggests accounting for counterflow through providing a dedicated stairway for emergency responders. During the initial phase of an evacuation, a dedicated stair could provide much needed egress capacity.

(4) From Section 10.1.2 of the NISTNCSTAR1-7 Report, occupant egress speeds on September 11th were below published speeds. It is possible, and perhaps likely, that occupant fatigue contributed to this. We recommend investigating the ability of a representative mixed ability population to travel down 40 to 70 or more stories of stairs. Based upon this observation, consideration may need to be given to including rest spaces on stair landings, in locations that will not affect the overall flow of occupants.

Revision Suggestion : (1) Substitute □better simulation of merging flows, better characterizing pre-decisional times, better understanding the range of occupant mobility, better understanding of visibility and egress through smoke and other adverse conditions be should given priority, and better understanding of how fatigue affects mobility, as well as fire fighter effectiveness, affect ascend/descending a large number of flights□ for the listed human factors to be analyzed.

(2) Add additional discussion to justify accounting for counterflows.

(3) Delete discussion related to dedicated fire fighter access stairway

(4) Add comment related to occupant travel speeds traversing down or up large number of stair flights.

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Phone : 415 957 9445
Report Number : NCSTAR 1
Page Number : 212
Paragraph : 9.2.5 / Recommendation 18
Comment : Recommendation 18 seems to primarily address exit remoteness for fires, rather than the full spectrum of extreme events. This conflicts with recommendation 18.
Comment Reason : Exit remoteness, in the context of extreme events, is difficult to effectively require through prescriptive criteria; meaningful separation in one event may not be effective in another type of event. The actual distance achieved depends on the size of the building, and a fixed minimum may simply be unachievable. For instance, consider a tall slender building with stairways located on opposite facades, while this scenario would work well for fires, it may cause additional exposure for external bomb threats.

Revision Suggestion : Change item (1) as follows □.. to maximize remoteness of egress components (i.e., stairs, elevators, exits) while achieving appropriate balance for other building threats, such as blast, or high-wind exposures and without negatively impacting the average travel distance ..□

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Email Address : jim.quiter@arup.com
Phone : 415 957 9445
Report Number : NCSTAR 1
Page Number : 213
Paragraph : 9.2.5 / Recommendation 19
Comment : This recommendation is vague. Additional detail describing the types of messages and updates, or perhaps recommending a task force to make these recommendations should be provided.
Comment Reason : While this recommendation is important, it is very board and vague. With the wide range of possible solutions, the overall industry response for this could become uncoordinated within a single focus.

Revision Suggestion : Provide additional details describing the types of messages and updated or recommend a task force to carry this forward.

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Name : Jim Quiter
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Email Address : jim.quiter@arup.com
Phone : 415 957 9445
Report Number : NCSTAR 1
Page Number : Appendix D
Paragraph : Appendix D
Comment : The □stop and go□ methodology is described in various locations throughout Appendix D. Section D.4.4 states that this simulation technique was used to account for □leaving/changing stairs (sometimes occupants did this multiple times) for various reasons, resting on the stairs, helping, waiting behind larger or disabled occupants, superflow, firefighter counterflow, etc,□ as EXIT89 and buildingEXODUS does not include the capability to simulate these. It is possible with STEPS to simulate counterflows, occupant resting on stairs, occupants waiting behind disabled occupant and debris blockages, although several minor code changes would simplify that process. Additionally, the physics of the model would support simulating superflows and leaving/changing stairs with some minor code modifications.
Comment Reason : A large set of simulations with varying ranges of possible flow stoppages would more closely model the actual phenomena and may lead to developing better design methodologies for extreme events.

Revision Suggestion : Extend the egress simulation task to include STEPS.

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Subject: WTC Draft Final Report Comment Form for Report: NCSTAR1-7

Information Submitted on: 8/1/2005.

Name : Jim Quiter
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Email Address : jim.quiter@arup.com
Phone : 415 957 9445
Report Number : NCSTAR1-7
Page Number : Appendix D
Paragraph : Appendix D
Comment : EXIT89 and buildingEXODUS develop differing predictions of evacuation time. Little discussion is provided regarding these differences.
Comment Reason : Users of evacuation simulation programs would benefit from a discussion of why these models provided differing results.

Revision Suggestion : Include additional discussion of differing results between EXIT89 and buildingEXODUS.

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Subject: WTC Draft Final Report Comment Form for Report: NCSTAR1-7

Information Submitted on: 8/1/2005.

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Phone : 415 957 9445
Report Number : NCSTAR1-7
Page Number : Appendix D
Paragraph : Appendix D
Comment : The □stop and go□ methodology is described in various locations throughout Appendix D. Section D.4.4 states that this simulation technique was used to account for □leaving/changing stairs (sometimes occupants did this multiple times) for various reasons, resting on the stairs, helping, waiting behind larger or disabled occupants, superflow, firefighter counterflow, etc,□ as EXIT89 and buildingEXODUS does not include the capability to simulate these. It is possible with STEPS to simulate counterflows, occupant resting on stairs, occupants waiting behind disabled occupant and debris blockages, although several minor code changes would simplify that process. Additionally, the physics of the model would support simulating superflows and leaving/changing stairs with some minor code modifications.
Comment Reason : A large set of simulations with varying ranges of possible flow stoppages would more closely model the actual phenomena and may lead to developing better design methodologies for extreme events.

Revision Suggestion : Extend the egress simulation task to include STEPS

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